



Combined Heat and Power Project at Antioch Community High School

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HOD Landfill History

- **51-acre municipal and industrial solid waste landfill, active from 1963 to 1984. (On USEPA Superfund list)**
- **35 gas extraction wells**
- **Current gas production is approximately 300 cubic feet per minute at 47% methane**
- **Projections show >150 cfm for the next 10-20 years**
- **Declared by USEPA ready for use as athletic fields**

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Gas extraction wellhead in vault - typical with
pneumatic pump installed

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Gas to Energy System Project History

- **Public notice posted in 1999**
- **School business administrator contacted WMI**
- **Options evaluated: industries and school**

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Gas to Energy System Project History (continued)

- **Successful Grant application for \$550,000**
- **Design started September 2002**
- **Construction Started December 23, 2002**

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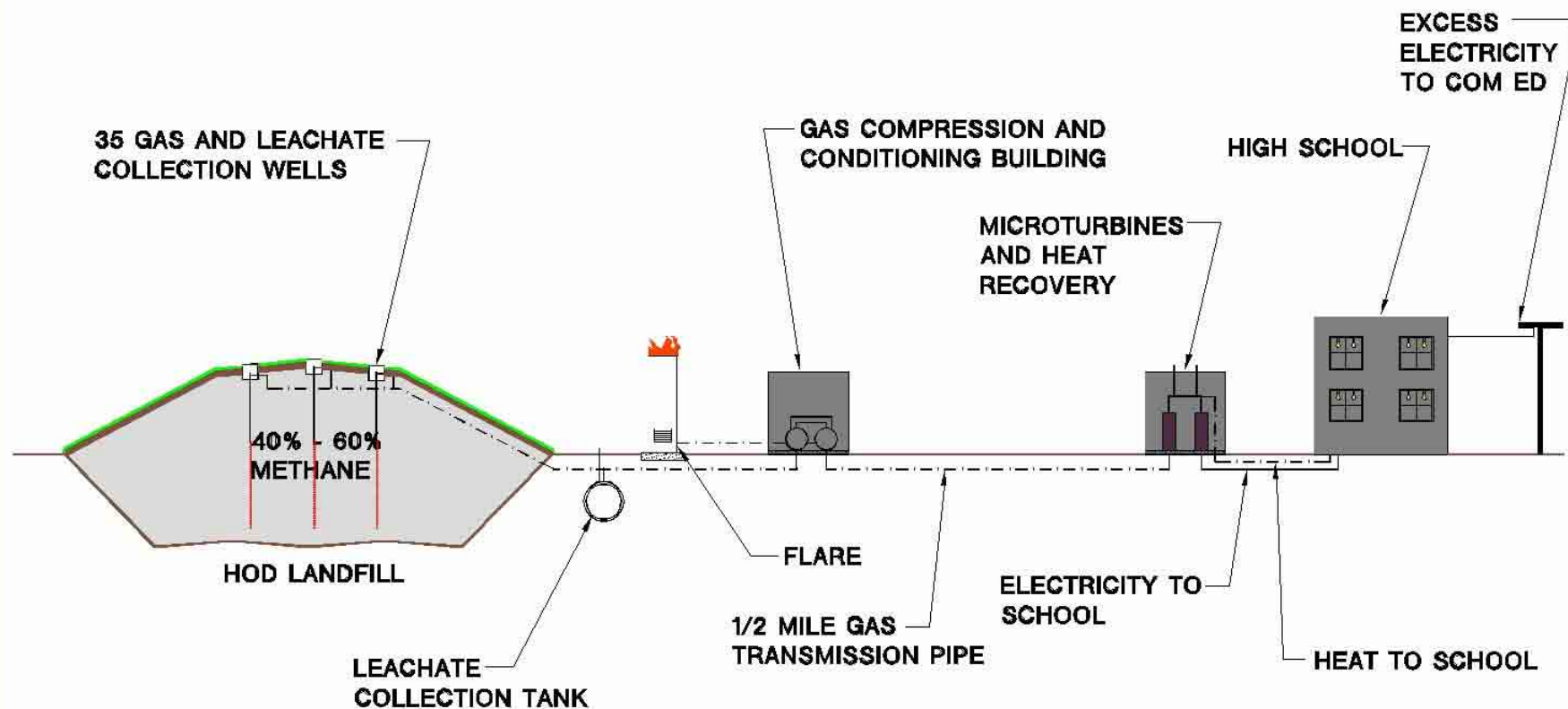
System Design

- Tie-in to existing gas collection system at the landfill
- Condition and compress the landfill gas at the landfill
 - Remove moisture and siloxane compounds
 - Remove siloxane compounds
- Drop gas temperature to -20°F
- Compress gas to 95 psi

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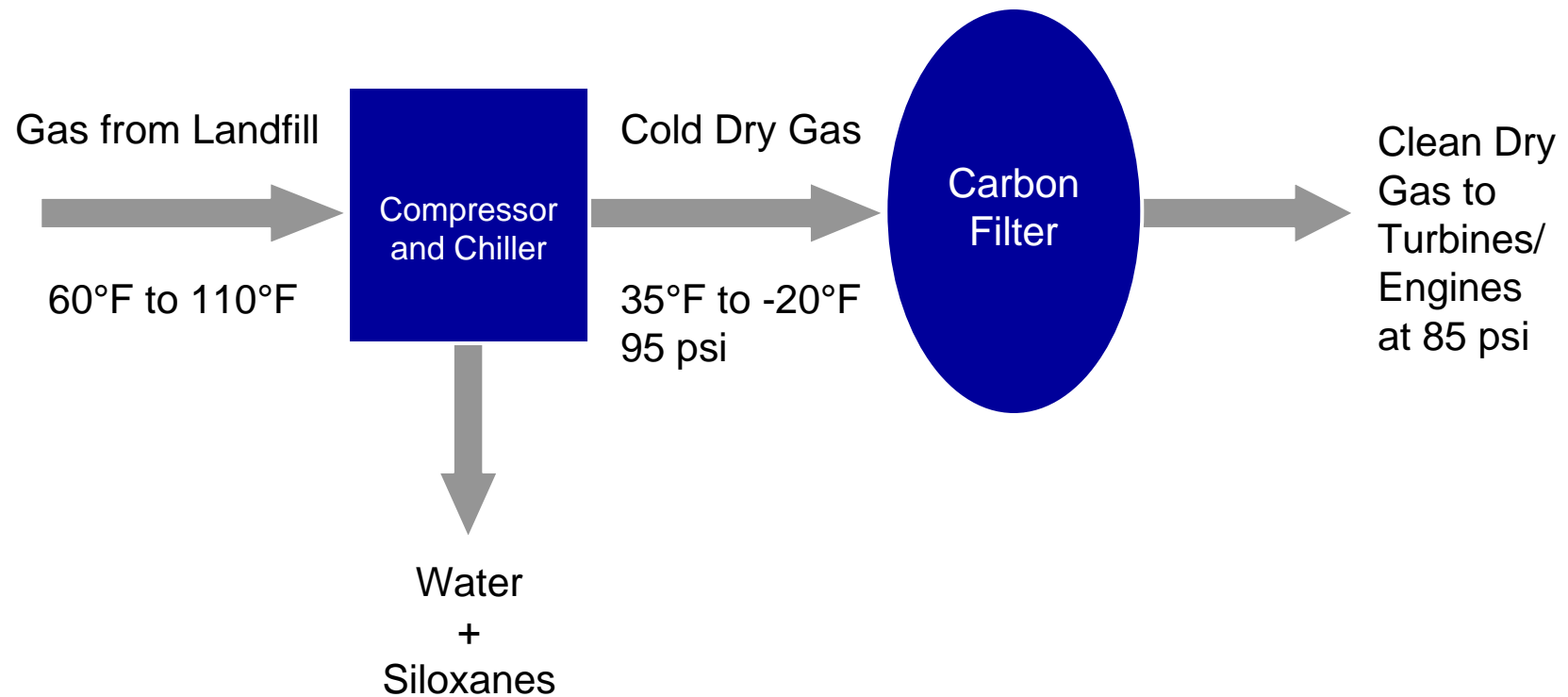
System Design (continued)

- Route gas to high school
- Twelve Capstone MicroTurbines, 360 kW at 480 volts
- The exhaust from the MicroTurbines is used to preheat water in high school heating system
 - Exhaust energy = 310,000 btu/hour/turbine

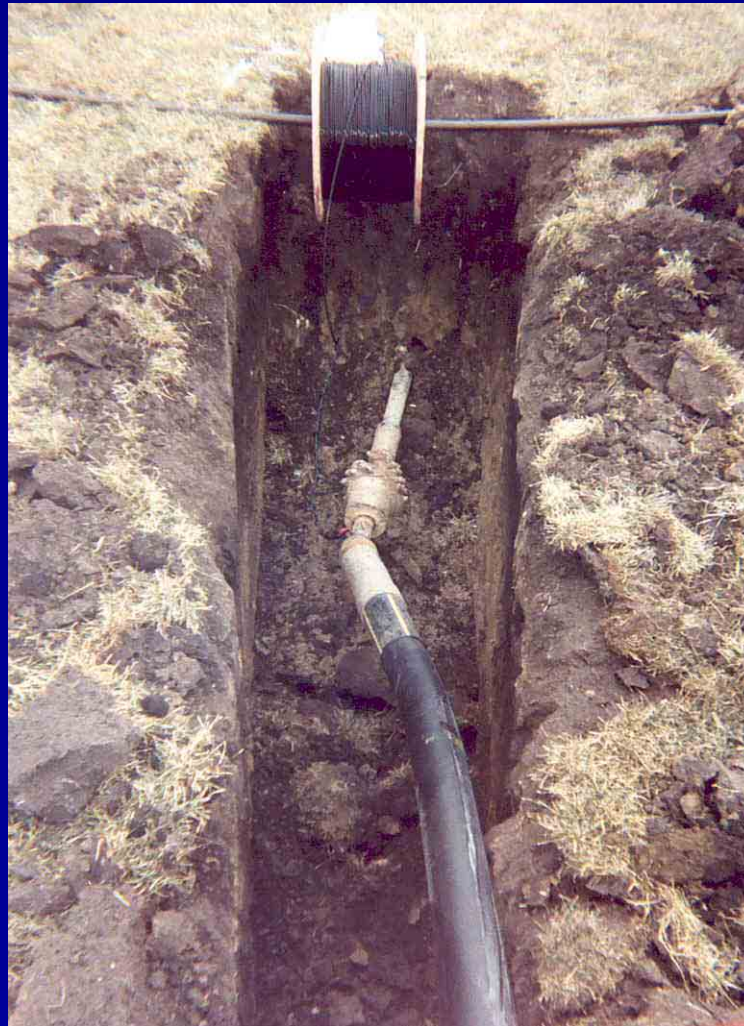


ANTIOCH HIGH SCHOOL LANDFILL GAS-TO-ENERGY PROJECT

Landfill Gas Conditioning System



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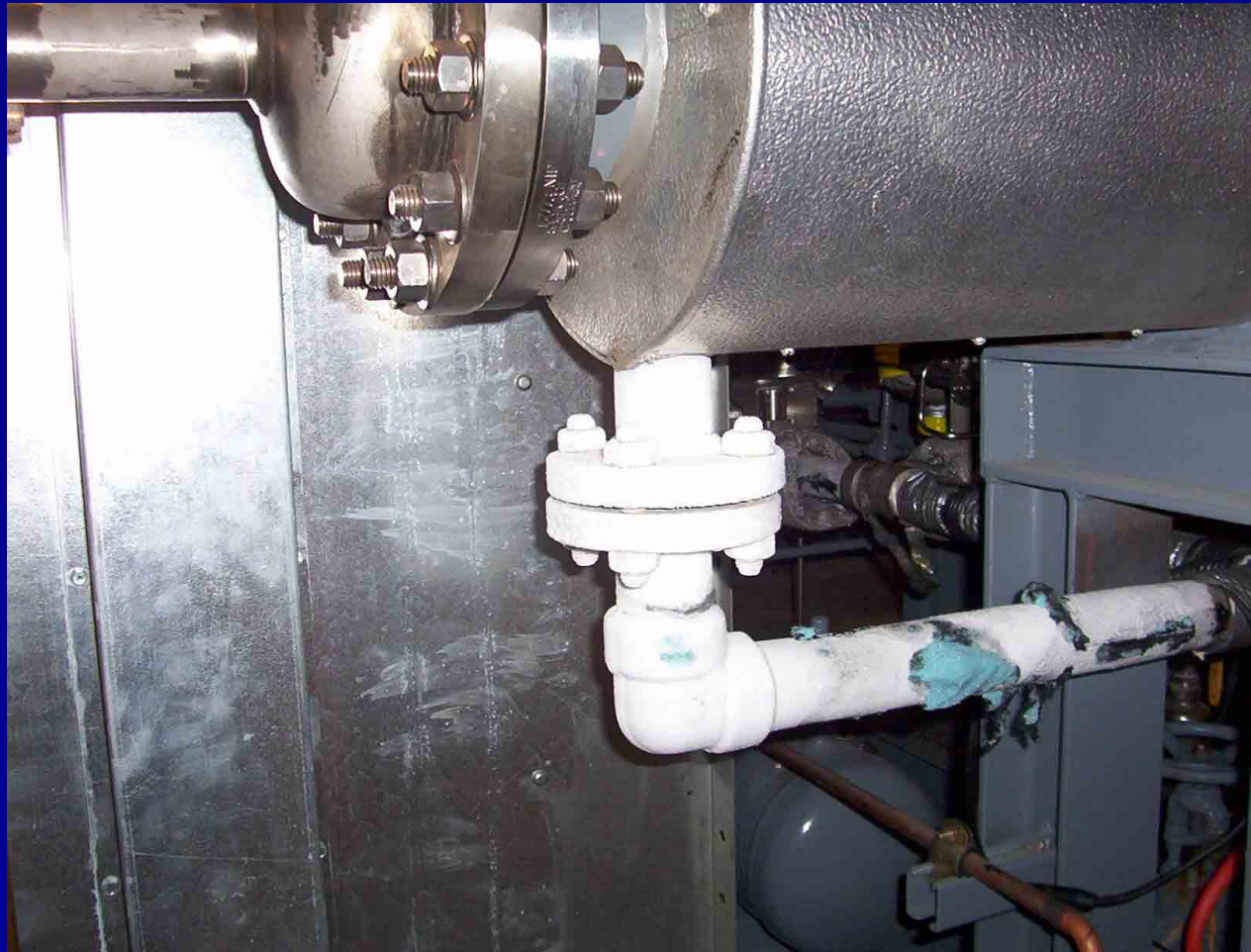
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Project Challenges

- **Gas piping beneath McMillen Road**
- **Electricity buy back - contract with ComED**
- **USEPA review and approval required**
- **Reducing impact of project on school activities**
- **Chilling gas to -20°F**

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Project Benefits

- **Cost savings to tax payers by using recovered gas to produce energy and heat**
- **Beneficially reusing landfill gas to produce environmentally friendly “green energy”**
- **Reduction in greenhouse gas emissions to environment**

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Project Benefits (continued)

- **Public relations and marketing of a waste-to-energy project for the community and the state of Illinois**
- **Educational possibilities (physics, chemistry, economics)**

Antioch Landfill Gas-to-Energy Project Key Players

*Antioch Community
High School*

RMT, Inc. Waste Management, Inc.

Illinois Dept. of Commerce and Economic Opportunity

USEPA

Strand Associates

Unison Solutions

Terra Engineering

Intercon Construction

Azco

Enerflex

Alliant Energy

Com Ed

ISCO Industries

Capstone MicroTurbines

Freddi Greenberg

Meyer Machine

Daoust Refrigeration

Continental Electrical

Johnson Controls

Ken Kogut